Patented Dec. 9, 1947

2,432,293

UNITED STATES PATENT OFFICE

2,432,293

ELEVATOR CAR DOOR CONTROL MECHANISM

Joseph Di Giovanni, Fairview, N. J., assignor to United Elevator Service, Inc., New York, N. Y.

Application August 19, 1944, Serial No. 550,217

7 Claims. (Cl. 187—52)

1

The present invention relates to means for opening and closing the doors leading to an elevator car and the shaftway therefor, particularly, for example, to a mechanism for operating the sliding doors with which automatic push button or passenger controlled elevator installations are equipped.

Heretofore in order to provide safe operation for the passenger, such automatic installations have included some means, for example, that known as a "safety edge," which will cause the door to stop and reverse its direction of movement should the passenger come between it and the edge of the car or hatchway.

This safety edge usually comprised a short strip of rubber, mounted on metal pivoted on the door between the car and hatchway doors and arranged to operate a reversing switch for the motor which controlled the opening and closing of the door.

Prior safety means have not been fully satisfactory because they have, at times, caused the elevator motor to stall and thereby seriously slow down the operation of the elevator. Further, with the prior devices, there is always an attendant danger that passengers may become injured when, in an attempt to prevent closing of the elevator and hatchway doors, they fail to engage such safety edge or other safety means and they therefore become caught between the hatchway or car door edge and either door post, which former, since it is positively driven by the motor operator thereof, continues its unstopped movement against them.

The present invention contemplates the provision of a safety means, which is designed and constructed to cause the car and hatchway doors or either of them to automatically reverse in direction of movement and move away from the passenger should either door be touched or pulled upon, independently of engagement by the passenger of a safety edge or other means arranged on the door itself.

Further with the safety means used in present installations, despite opening the switch thereof, circuit of the motor operating the door may nevertheless remain closed and continue the positively driven movement of the door or doors toward or against the passenger, which continued positively driven movement may cause damage to the mechanism and injury to the passenger.

The present invention further contemplates the provision of a coupling means between the door and its operating motor of construction and arrangement such that, upon obstruction of the door, the operating motor therefor is automatically disengaged therefrom and therefore the door or doors cannot be positively driven against the passenger or obstruction irrespective of the proper operation of the switch designed to open the motor circuit.

2

The present invention still further contemplates the provision of a switch for the door operating motor that is automatically operated by closing movement of the doors and the imposition of an obstruction to such movement to reverse the door operating motor and leave free for the passenger entrance to or exit from the car.

The present invention still further contemplates the provision of positive drive means constructed and arranged to open and close the doors uniformly, gradually and slowly at the commencement and finish and so without jar or damage to the mechanism or danger to the passenger upon closing the door, this is accomplished independently of the operation of the door motor, in the event of failure of the switch to reverse the motor when the movement of the door is obstructed and the obstruction removed.

With present automatic elevator installations, a coupling mechanism is provided for concurrently opening and closing the car and hatchway doors. The hatchway doors are each provided with a member or arm, which is engaged by a link or lever secured to the door, which latter must be sufficiently close to the hatchway door member or arm to, at the correct time, engage it and so properly open and close the hatchway door concurrently with and under the influence of the car door but yet have sufficient clearance between the two so that they will not strike or rub against each other as the car moves past each normally closed hatchway door.

The present invention therefore still further contemplates the provision of a coupling means on the car door, arranged and constructed to automatically engage and grip a member or arm on the hatchway door just prior to opening the car door, so that when the latter door is fully and firmly closed and the hatchway door locked, the door operator motor nevertheless continues operation to thereby cause the coupling mechanism to be positioned at such distance from the hatchway door member or arm as will allow the car to travel past those doors without striking the members or arms or in any way interfering with the electrical or mechanical door contacts.

Present automatic installations include a hatchway door lock which is retired somewhat